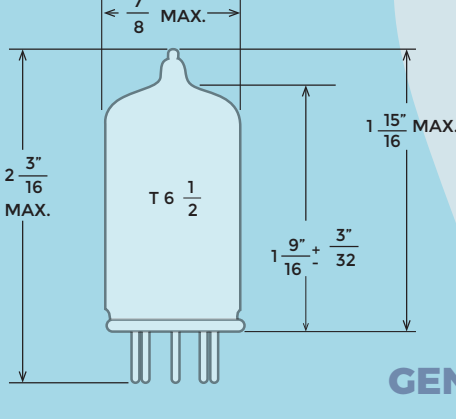




**12AX7 (aka ECC83)** is a vacuum tube that is a miniature dual-triode 6AV6 with high voltage gain.

The 12AX7 is a high-gain (typical amplification factor 100), low-plate-current triode best suited for low-level audio voltage amplification. In this role it is widely used for the preamplifier (input and mid-level) stages of audio amplifiers



### GENERAL

Cathode-Coated Unipotential	Series	Parallel
Heater Voltage, AC or DC	12.6	6.3 Volts
Heater Current	0.15	0.3 Amperes
Envelope—T-6 <sup>1/2</sup> , Glass		
Base—E9-1, Small Button 9-Pin		
Mounting Position—Any		

Direct Interelectrode Capacitances	With Shield*	Without Shield
Grid to Plate, Each Section	1.7	1.7 uuf
Input, Each Section	1.8	1.6 uuf
Output, Section 1	1.9	0.46 uuf
Output, Section 2	1.9	0.34 uuf

### BASING DIAGRAM



RETMA 9A  
BOTTOM VIEW

### TERMINAL CONNECTIONS

- Pin 1—Plate (Section 2)
- Pin 2—Grid (Section 2)
- Pin 3—Cathode (Section 2)
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Plate (Section 1)
- Pin 7—Grid (Section 1)
- Pin 8—Cathode (Section 1)
- Pin 9—Heater Center-Tap

### MAXIMUM RATINGS

#### DESIGN-CENTER VALUES, EACH SECTION

Plate Voltage	300 Volts
Positive DC Grid Voltage	0 Volts
Negative DC Grid Voltage	50 Volts
Plate Dissipation	1.0 Watts
Heater-Cathode Voltage	
Heater Positive with Respect to Cathode	180 Volts
Heater Negative with Respect to Cathode	180 Volts

### CHARACTERISTICS AND TYPICAL OPERATION

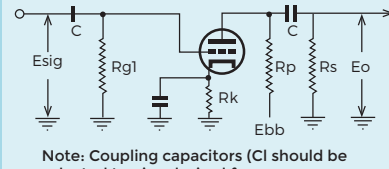
#### CLASS A, AMPLIFIER, EACH SECTION

Plate Voltage	100	250 Volts
Grid Voltage	-1	-2 Volts
Amplification Factor	100	100
Plate Resistance, approximate	80000	62500 Ohms
Transconductance	1250	1600 Micromhos
Plate Current	0.5	1.2 Milliamperes

With external shield (RETMA 315) connected to cathode of section under test.

#### CLASS A RESISTANCE-COUPLED AMPLIFIER EACH SECTION

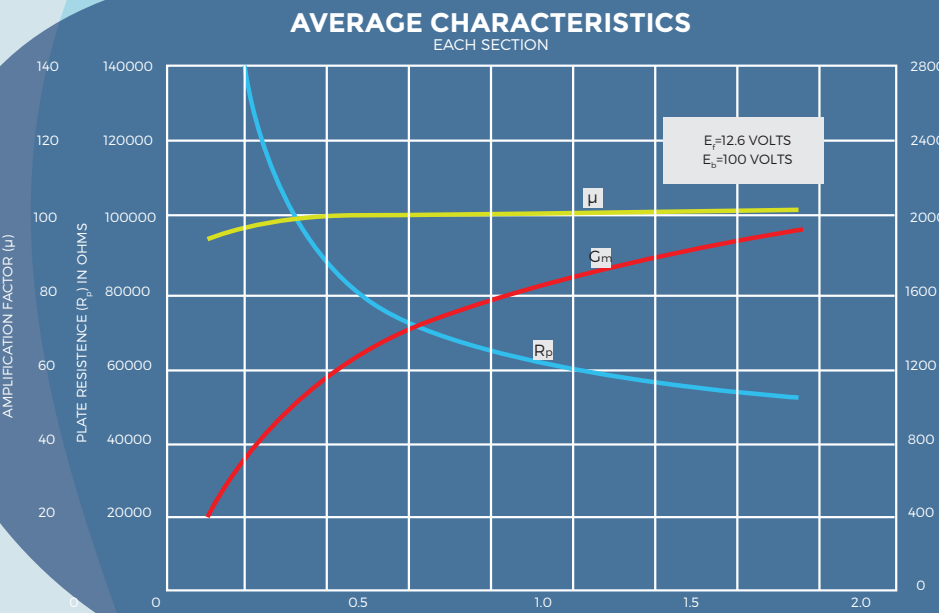
Rp Meg.	Rs Meg.	Rg1 Meg.	Ebb: 90 Volts			Ebb: 180 Volts			Ebb: 300 Volts		
			Rk	Gain	Eo	Rk	Gain	Eo	Rk	Gain	Eo
0.10	0.10	0.1	1700	31	5.0	1000	40	15	760	43	30
0.10	0.24	0.1	3500	43	6.5	2000	54	18	1600	58	37
0.24	0.24	0.1	3900	49	8.6	2300	59	24	1800	64	47
0.51	0.51	0.1	7100	50	7.4	4300	62	19	3100	66	39
0.51	1.0	0.1	7800	53	9.1	4800	64	24	3600	69	46
0.24	0.24	10	0	37	3.9	0	53	15	0	62	32
0.24	0.51	10	0	44	5.4	0	60	19	0	67	41
0.51	0.51	10	0	44	5.0	0	61	17	0	69	35
0.51	1.0	10	0	49	6.4	0	66	21	0	71	41



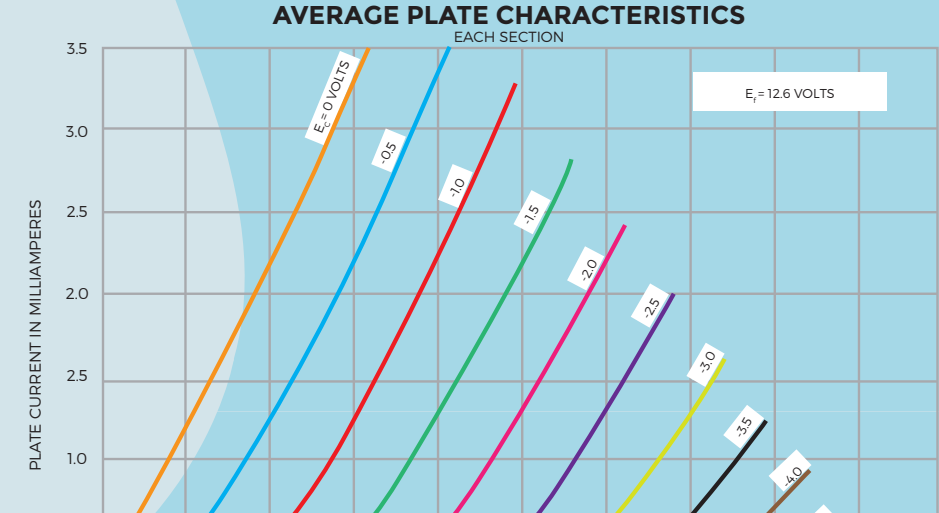
Note: Coupling capacitors (C) should be selected to give desired frequency response. Rk should be adequately by-passed.

Notes: 1. Eo is maximum RMS voltage output for five percent 1591 total harmonic distortion. 2. Gain measured at 2.0 volts WS output. 3. For zero-bias data, generator impedance is negligible.

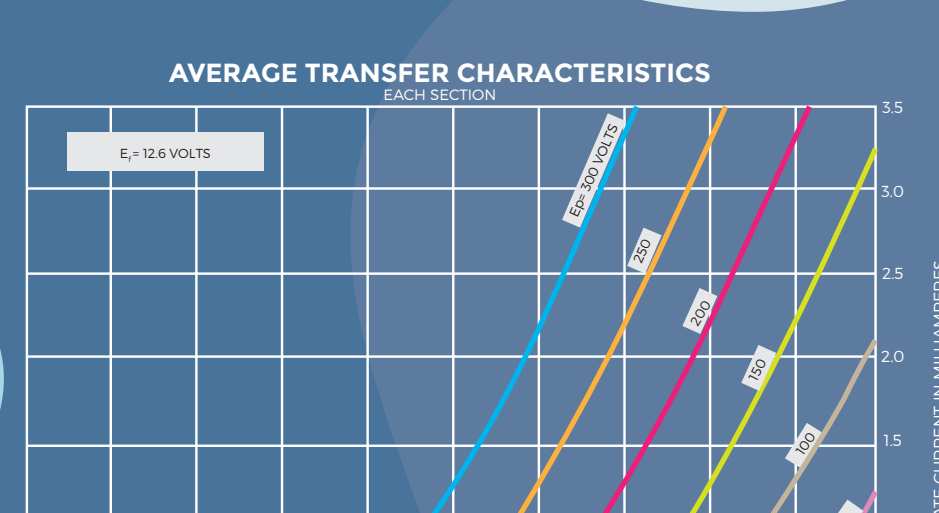
### AVERAGE CHARACTERISTICS EACH SECTION



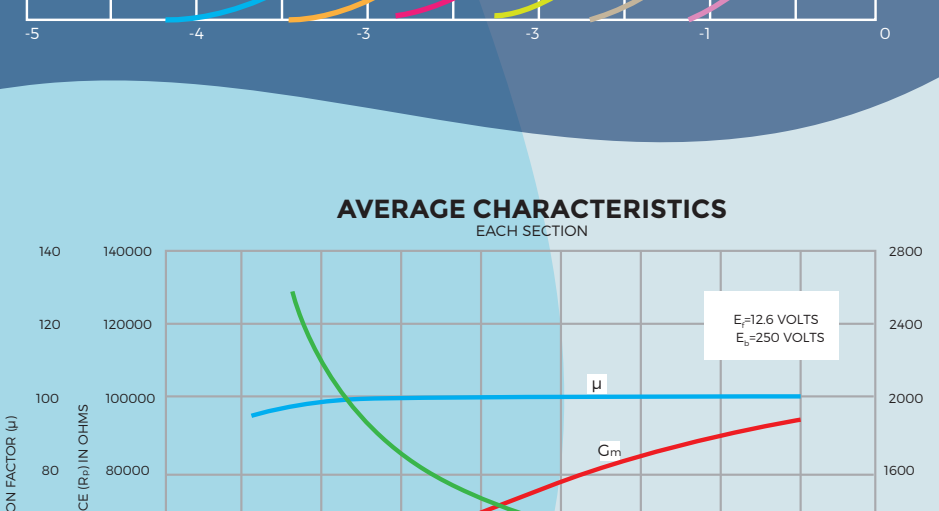
### AVERAGE PLATE CHARACTERISTICS EACH SECTION



### AVERAGE TRANSFER CHARACTERISTICS EACH SECTION



### AVERAGE CHARACTERISTICS EACH SECTION



#### Sources

<http://www.r-type.org/pdfs/12ax7.pdf>  
<https://en.wikipedia.org/wiki/12AX7>

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